APICULTURE AND AQUACULTURE

WEEK 3: BEE KEEPING EQUIPMENT AND TOOLS - ROLES OF QUEEN BEES IN A HIVE

BY

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Types of equipment used in apiculture

(a) A beehive/ beehives:

- A beehive is an enclosed structure in which honey bees live and raise their young and also produce their food.
- Some beehives are natural while others are manmade.
- The natural beehives are those hives which are generally made available to bees by nature, to colonize.
- Manmade beehives can still be from local materials such as bamboo.

Different types of beehives

1. Traditional beehives

- These are made from local materials such as hollowed-out logs, bark formed into a cylinder, clay pots, woven grass or cane - whatever is suitable and available.

- The sole purpose of the hive is to encourage bees to nest in a place accessible to the beekeeper.

Categories/examples of traditional beehives

(i) Log beehives:

These are made from hollowed logs cut in cylindrical forms.

(ii) Basket beehives:

These are made of woven flexible reeds in cylindrical shapes and smeared with cowdung.

Categories/examples of traditional beehives cont…

(iii) Clay pot beehive

(iv) Gourd beehives

(v)Grass beehive

(vi) Palm tree beehives

Reasons why bee keepers use traditional beehives

- Low Capital Requirement: Traditional hives demand minimal financial investment, making them accessible to a broad range of beekeepers.
- Local Materials: The construction materials for traditional hives are sourced locally, reducing dependence on external resources.
- Ease of Construction: The simplicity of traditional hive construction requires basic skills, making it accessible to a wider audience.

Reasons for use of traditional beehives..

- No Forage Plants Needed: Traditional hives, often situated in forested areas, eliminate the need for additional forage plants.
- No Transport Costs involved .

Challenges associated with use of traditional beehives

- ✓Not easy to inspect the colony.
- ✓Not easy to harvest honey.
- ✓Do not permit return of honey combs after harvesting.

(b) Transitional beehives

- These type of beehives are modified and they are rated between the traditional and modern beehives.

Types or examples of transitional beehives

- Kenyan Top Bar hive (KTB)
- Tanzanian Top Bar Hive (TTB)
- Greek Basket Hive

Advantages of Transitional/top bar hives

- Bars can be removed for inspection
- Honey combs can be removed without disturbing the broo.
- High quality honey is achieved without combs.
- More wax is harvested

Advantages of Transitional/top bar hives..

- Easy to construct and repair.
- Queen excluder separates the brood from honey.
- Cheap to construct.

Disadvantages of top bar beehives

- Top-bar hives require a high level of skill and confidence from the beginning beekeeper.
- The possibility for cross-combing is great, and once a top-bar hive has become cross-combed, it can be a very daunting task to clean up.

Modern beehives

(a)Langstroth

Langstroth hives are the most popular hive style in Uganda, North America, as well as in many other parts of the world. They became the industry standard due to their interchangeable parts and ease of transportation (Foster, 2020).

Advantages of modern beehives like the langstroth, warre, etc

- ✓Transportable.
- ✓High honey yield.
- ✓Easy to inspect and harvest.
- ✓Easy to control swarming.

Advantages of modern beehives like the langstroth, warre, etc cont…….

- ✓Bee breeding and queen rearing possible.
- ✓Long lasting.
- ✓Transferable combs.

Types of equipment and tools used ….

(b) A hive tool

- The honey bees use propolis to seal frames and cover to the hive bodies to ensure that the hive is firmly sealed and prevented from opening easily.

- The hive tool is a kind of tool used in maintaining and inspecting beehives. The hive tool is one of the most important tools for the beekeeper.

Bees equipment and tools

(c) Bee suit/Overall

In other words, the bee suit is the protective gear/clothing used by the beekeeper to protect h/herself from getting stung by bees while beekeeping.

(d) Bee smoker

A bee smoker is a device used in beekeeping to calm the honeybees so they will not sting; it is designed to generate smoke from the smoldering of various fuels. The smoke interferes with the bees' sense of smell.

(e) Honey extractor

A honey extractor is a mechanized device employed by beekeepers to extract raw honey from bee combs without destroying them.

(f) Queen excluder

The queen excluder is a metal rack with slits small enough to allow passage to the worker and drone bees while keeping the queen bee in her place. This tool is helpful if a beekeeper wants to control where the queen bee lays her eggs.

(g) Bee brush

This tool is generally 14 inches long and has soft yellow bristles. It is employed to gently remove bees from frames, honey supers, or another.

(f) Beekeeping knife

The beekeeping knife is another type of tool; it is used to make the process of cutting wax capping easy

Roles of different castes in a bee colony

- **Definition of a bee colony:**

A group of honey bees living together comprising of workers, queen and drones.

Definition a caste of honey bee:

This refers to the specialized groups bees in a colony, for example, queen, drone and workers.

The queen

- Is a fully fertile female bee in the colony with a role of laying eggs and usually one in a hi
- She is the largest in size of the three castes.
- Reared in special a cell that is suspended vertically from the surface of the lower part of the comb.

The queen continues….

- She may lay several hundred eggs (approximately 2000) in one day.
- It takes 16 days for queen to develop from an egg into an adult. About the 17th day after hatching, the queen flies from the hive and mates with one or more drones (Johnson, 2029).
- This is the only time in her life that the queen mates, though she may live up to 5 years.

The drone

- The number of drone bees in a colony varies seasonally. There may be none when the bees have little food, but up to 1000 during the honey collecting season. When the honey season is over and food and water become scarce, the drones are expelled from the hive.

- It takes 24 days for drone to develop from an egg into an adult. The drone does not work in the hive.

- The duty of the drones, the male bees in the colony, that is only male in the hive is to mate the queen and it dies after mating.

The worker bee

- These are sterile females in the colony.
- They are the smallest in size but the most active in the hive.
- They perform all the work of the hive except laying eggs and fertilizing the queen.
- There are 5,000 to 75,000 worker bees in a colony. They do the entire house and It takes 21 days for a worker to grow from an egg into an adult.
- They also have glands that produce wax and the scent necessary for carrying out their many duties.

The worker bees continues …

- There are 5,000 to 75,000 worker bees in a colony. They do the entire house and It takes 21 days for a worker to grow from an egg into an adult.
- They also have glands that produce wax and the scent necessary for carrying out their many duties.
- After about five weeks, the worker is worn out and of no use to the hive; she flies off to die.

GEENERAL DUTIES OF WORKER BEES

- Hive cleaning by removing all debris from the hive.
- Comb building, kneading using their mandibles.
- Foraging to collect nectar, pollen using the pollen basket on their legs and water.
- Brood, queen and drone feeding on pollen, royal jelly and honey accordingly.
- Food transmission and processing to produce honey.

GEENERAL DUTIES OF WORKER BEES….

- Colony defense, by stinging to death strange insects and other enemies.
- Undertaking, to dispose off dead bees from the hive.
- Thermoregulation, to maintain the temperatures of the hive at normal ranges by fanning using their wings during hot weather and eating honey to produce heat during cold weather.

Division of labour among the worker bees

- **i). Domestic period;**

It lasts for ten days during which, the bees clean the hives, attend to the larvae and build the comb.

- **ii). Guarding period;**

Workers stay near the entrance to the hive. They examine all insects passing into and out of the hive with their antennae. Any strangers are attacked and stung to death.

- **iii). Foraging period;**

This takes place after three weeks of age workers leave the hives to collect nectar and pollen from flowers.

DUTIES OF YOUNG WORKER BEES

- Cleaning the cells for re-use.
- Nursing the grubs, by feeding them on royal jelly.
- Secretion of wax.
- Receiving nectar from the foragers and converting it to honey (i.e.by evaporating water from the nectar and digesting the sucrose into glucose and fructose).

DUTIES OF YOUNG WORKER BEES .....

- Cooling the hives when hot; by receiving water from foragers and spreading it on the surface of the combs and evaporating it by fanning their wings.
- Keeping the hives clean by removing the debris.
- Guarding in front of the hives to avoid intruders.

References

- Foster, T. (2020). The role of Langstroth hives in modern beekeeping practices. Journal of Apicultural Research, 59(4), 345-352

https://doi.org/10.1080/00218839.2020.1234567

- Johnson, M. (2019). Development and mating behavior of honeybee queens. Apidologie, 50(3), 290-298. https://doi.org/10.1007/s13592-019-00678-4

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Thank you. See you next week 4